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1994 Feature Article - Predicting Private New Capital Expenditure Using Expectations Data

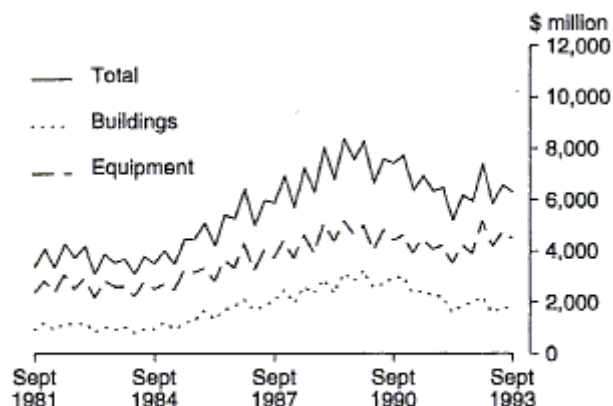
This article was published in Australian Economic Indicators January 1994 issue on 11 January 1994.

INTRODUCTION

The Australian Bureau of Statistics (ABS) runs a quarterly Survey of Private New Capital Expenditure. As well as collecting actual expenditure for the last quarter, this survey also collects information on what investment businesses expect to make on capital expenditure over the coming financial year. Some research work has been undertaken in the ABS on how to make best use of available expectations data in predicting actual expenditure, and has been published in Econometrics Working Paper No. 93/1 D. Burnell and P. Rossiter, investment Expectations: A Description of the Unit Record Data in the Private New Capital Expenditure Survey (cat. no. 1351.0).

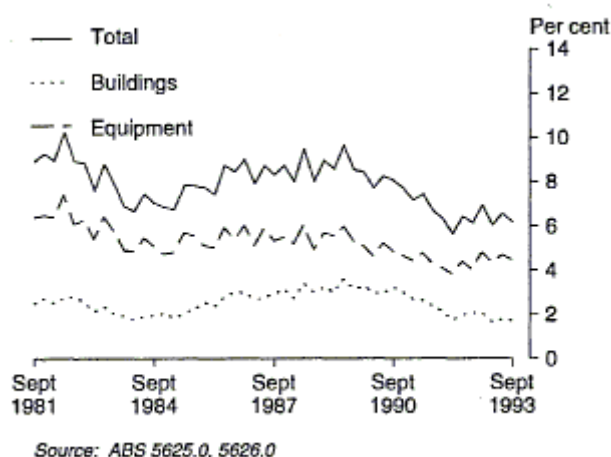
Estimates of actual and expected investment from the survey are published in the quarterly Private New Capital Expenditure, Preliminary (cat. no. 5625.0) and Private New Capital Expenditure (cat. no. 5626.0). Investment can be split into outlays on plant, equipment and machinery, and buildings and structures (see Graph 1), with the former being the larger component and currently representing approximately 4 per cent of expenditure based Gross Domestic Product (GDP(E)), and the after contributing 1.8 per cent (see Graph 2).

GRAPH 1. PRIVATE NEW CAPITAL EXPENDITURE



Source: ABS 5625.0, 5626.0

GRAPH 2. RATIO OF CAPITAL EXPENDITURE TO GDP(E)



After providing a brief background to the survey methodology, this article will introduce a tool for analysing expectations estimates, the realisation ratio. Realisation ratios are calculated as the ratio of actual to expected investment and are used to adjust expectations data for known patterns of past under or over estimation. Realisation ratios can be used to adjust investment expectations data to estimate future investment outlays. The realisation ratios used can be calculated from the latest available data, or calculated by combining past ratios, in order to smooth for volatility in investment. This article discusses two methods of adjusting expectations data:

- using the most recent realisation ratio; and
- using the five year average of realisation ratios

OVERVIEW OF THE SURVEY

Estimates from the Survey of Private New Capital Expenditure are compiled using data from 16 selected industries. In June each year a random sample of approximately 8,500 businesses, stratified by industry and number of employees, is selected from the ABS central business register. All businesses having more than 140 employees are automatically included in the sample. In addition, an attempt is made to ensure small businesses, or new businesses not recorded on the register, with very large investment projects are sampled by including them in a supplementary survey.

The survey forms are usually despatched to management units during the last (week of the quarter for which actual expenditure is collected, and reported and returned for processing during the following two months. Table 1 presents an explanation of the timing of the collection of estimates in the survey. Respondents are asked for details of actual investment, and expected investment for 3, 6 and 12 month intervals. As Table 1 shows however, the length of expected short-term and long-term investment expenditure reported varies, depending on the stage in the reporting period (footnote 1).

TABLE 1. EXPLANATION OF TIMING OF ESTIMATES FOR COMING YEAR t , COMPOSITION OF ESTIMATES

Estimate	Based on data from survey quarter -	Data available on actual expenditure in year t	Data on short-term expected expenditure in year t	Data on long-term expected expenditure in year t
1	December (year t-1)	nil	nil	12 months
2	March (year t-1)	nil	nil	12 months
3	June (year t-1)	nil	6 months	6 months
4	September (year t)	3 months	3 months	6 months
5	December (year t)	6 months	6 months	nil
6	March (year t)	9 months	3 months	nil
7	June (year t)	12 months	nil	nil

Each row in Table 1 represents a progressive estimate of financial year investment, constructed by adding together the three components across each row. The seven progressive estimates are published for four broad industry groups:

- Mining;
- Manufacturing;
- Finance, property & business services; and
- Other selected industries (including electricity, gas and water, construction, wholesale and retail trade, transport and other non-manufacturing industries).

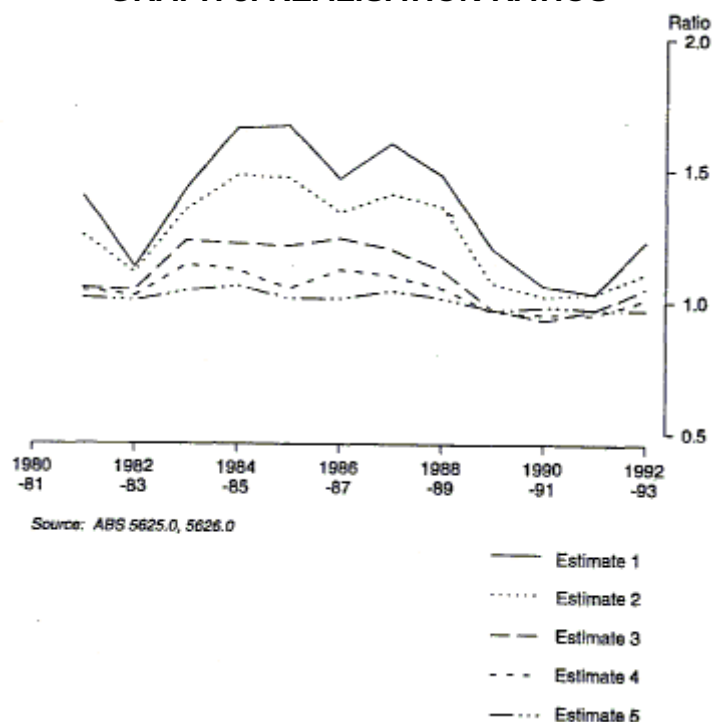
Realisation ratios, calculated by dividing the final actual expenditure (Estimate 7) by each successive quarterly estimate (Estimates 1 to 7), are reproduced in Table 2 (which can be calculated from the estimates published in 5626.0 or from Table 5.6 in this publication). When a realisation ratio is greater than one, then actual investment has exceeded expectations. If the realisation ratio is less than one, then actual investment has fallen short of expectations. A realisation ratio of one indicates expectations were equal to realised outcomes, and occurs in Estimate 7 when investment expenditure is fully realised.

TABLE 2. REALISATION RATIOS

Year Ending	Expected expenditure reported 5-6 months before period began (Estimate 1)	Expected expenditure reported 2-3 months before period began (Estimate 2)	Expected expenditure reported at beginning of period (Estimate 3)	Expected expenditure reported 3-4 months into period began (includes 3 month actual expenditure) (Estimate 4)	Expected expenditure reported 6-7 months into period began (includes 6 month actual expenditure) (Estimate 5)	Expected expenditure reported 9-10 months into period began (includes 9 month actual expenditure) (Estimate 6)	12 months actual expenditure (Estimate 7)
1982	1.40	1.25	1.05	1.04	1.01	0.99	1.00
1983	1.13	1.11	1.04	1.02	1.00	0.99	1.00
1984	1.43	1.35	1.23	1.14	1.04	0.99	1.00
1985	1.66	1.48	1.22	1.12	1.06	1.00	1.00
1986	1.67	1.47	1.21	1.05	1.01	0.98	1.00
1987	1.47	1.34	1.24	1.12	1.01	0.98	1.00
1988	1.60	1.41	1.20	1.10	1.04	1.01	1.00
1989	1.48	1.36	1.12	1.05	1.01	0.98	1.00
1990	1.20	1.07	0.97	0.96	0.97	0.97	1.00
1991	1.06	1.02	0.93	0.95	0.98	0.98	1.00
1992	1.03	1.03	0.97	0.95	0.97	0.96	1.00
1993	1.23	1.11	1.05	1.01	0.97	0.96	1.00

The realisation ratios in Table 2 show a systematic upward bias, indicating that expected investment consistently under predicts actual investment, suggesting respondents give conservative forecasts. Graph 3 shows that realisation ratios for Estimates 1 through 5, between 1982 and 1993, rise during periods of strong growth in the economy (reflecting high actual investment relative to expected investment), such as between 1984 to 1986, and fall during periods of economic slowdown or recession, such as in 1983, and between 1989 to 1992. Positive business conditions may therefore be associated with high realisation ratios. Likewise, adverse business conditions may be associated with realisation ratios close to one.

GRAPH 3. REALISATION RATIOS



ANALYSIS OF INDIVIDUAL RECORDS

Both the historical behaviour of realisation ratios, and their systematic upward bias, may be better under-stood from an understanding of the pattern of survey responses. Semi-annual June and December short-term expectations, reported by businesses, were compared with realised outcomes over a four year period between December 1987 and June 1991(footnote 2). Individual businesses were split into seven groups based on the number of employees, enabling analysis of businesses according to their employment size. Table 3 for example shows that on average, the magnitude of capital investment is proportional to the number of employees of a business.

TABLE 3. AVERAGE CAPITAL INVESTMENT BY EMPLOYMENT SIZE
Half year ending December 1989 - dollars

Number of employees	Actual	Expected
1-11	7,483	4,385
12-30	50,048	82,993
31-80	187,628	167,533
81-140	439,227	329,721

141-275
276+
Supplementary

797,467
3,918,171
8,845,970

821,736
4,964,101
9,153,895

An important characteristic of the survey responses is the high incidence of zero responses, i.e. when the management unit reports that no investment occurred within the reference period, and/or no investment is anticipated in the next reference period.

Graph 4 illustrates this, showing that the incidence of zero reporting is closely related to the size of the business, ranging from about 80 per cent for the smallest businesses to approximately 20 per cent for the largest businesses. Also, on average, businesses predict zero expected future investment to a greater degree than they incur zero actual expenditure. While this difference may appear small, the difference in the non zero proportion of responses (the inverse of Graph 4) is very significant for those businesses that employ less than 80 people.

GRAPH 4. PROPORTION OF ZERO RESPONSES BY SIZE OF BUSINESS

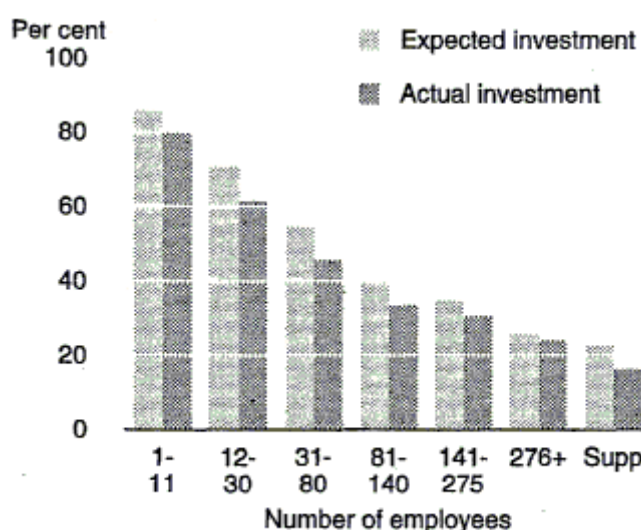


Table 4 presents the realisation ratios calculated from all data, and from matched data, the subset of businesses providing a non-zero response to both actual and expected investment for the same reference period. In most occasions, realisation ratios derived from the complete data set are higher. This is mainly due to the higher proportion of zero responses to the expectations question, than to the actual i.e. to businesses foreshadowing no future expenditure more often than they have indicated no current expenditure.

TABLE 4. COMPARISON OF REALISATION RATIOS DERIVED FROM ALL DATA AND MATCHED NON-ZERO DATA

Half year ending	Number of employees					
	1-11	12-30	31-80	81-140	141-275	276+ Supplementary
December 1987						
All Data	1.27	1.40	1.25	1.02	1.25	1.00
Matched Data	1.22	1.22	1.21	0.92	1.23	0.99

June 1988							
All Data	1.51	1.20	1.30	1.11	0.91	1.11	0.93
Matched Data	1.15	1.08	1.23	1.00	0.88	0.89	0.91
December 1988							
All Data	1.23	0.99	1.33	1.20	0.96	1.06	0.91
Matched Data	0.99	0.78	0.91	1.20	0.94	0.94	0.85
June 1989							
All Data	1.46	1.26	1.21	1.15	0.94	1.23	1.01
Matched Data	0.94	1.16	1.20	1.08	0.93	0.82	0.86
December 1989							
All Data	1.71	0.60	1.12	1.33	0.97	1.27	0.97
Matched Data	0.90	1.47	1.14	1.14	1.10	0.87	0.86
June 1990							
All Data	1.12	1.01	1.60	1.08	0.90	1.24	0.69
Matched Data	1.03	0.95	1.56	1.13	0.89	0.82	0.77
December 1990							
All Data	1.39	1.29	1.51	1.51	1.08	1.35	1.02
Matched Data	0.95	1.04	1.04	2.18	1.17	0.77	0.85
June 1991							
All Data	1.76	1.27	1.05	0.93	0.88	1.25	0.75
Matched Data	1.00	1.14	1.00	0.91	0.85	0.78	0.87

The table also shows that for matched businesses employing more than 140 people, realisation ratios tend to less than one, indicating that larger businesses tend to be overly optimistic in reporting expectations. That this is widespread across larger businesses is supported by the fact that a majority of these businesses provide optimistic investment expectations, which are not matched by their own actual outcomes (footnote 3). This optimism may be partly due to larger businesses quoting budget ceilings for expected in-vestment outlays, to cover adverse or unanticipated movements in inflation, exchange rates, or volumes. This optimism however, is more than offset by a substantial majority of businesses in the smaller sized categories which report lower levels of expected in-vestment than is finally realised. This indicates that in smaller businesses, high realisation ratios are due to both different proportions in zero responses and business pessimism.

The impact of zero responses upon the realisation ratios will also be evident in the realisation ratios for other planning horizons. In fact, the incidence of zero reporting (for expectations) increases with the length of the planning horizon. Thus, when successive expectations of investment for a given financial year are examined (across the rows of Table 2) it is likely that much of the systematic growth between Estimates 1 and 7 can be attributed to the effect of zero expectations being converted to non zero actual expenditures.

It is difficult to form general conclusions about the investment behaviour of different sized businesses, as the data covers industries with markedly different approaches to investment. Nonetheless, the tendency to plan and report investment is clearly related to employment size, and it is apparent that smaller businesses differ fundamentally from larger businesses.

It can be reasonably hypothesised that relatively smaller businesses have fewer planning/ reporting resources than larger businesses, leading to the likelihood that expenditure on items such as office equipment may not even be reported, as they may not be understood to be capital expenditure. Also, the higher proportion of zeros in expected investment, compared with actual investment, may be partially explained by actual investment being made up of investment arising from unforeseen circumstances such as replacement for broken equipment. It is likely that these factors contribute significantly to under-reporting of investment, and a high proportion of zero responses.

By contrast, larger businesses need to invest (in nominal terms) more heavily in capital than smaller businesses, and are therefore more likely to expend resources on planning and budgeting. Long-term budgets formulated by larger businesses are available for survey estimates and progressive investment payments are more likely to occur, resulting in a lower proportion of zero responses, relative to smaller businesses.

The Incidence of Rounded Responses

The tendency for relatively larger businesses to expend more resources, into planning and budgeting, also tends to be supported by the frequency with which small businesses round their estimates relative to larger businesses (to the nearest thousand, hundred thousand or million). Smaller businesses are much more likely to report rounded estimates, and all businesses are more likely to provide a rounded estimate of expected investment.

Over one-third of businesses, with less than 141 employees, rounded their estimates of actual investment, while nearly two-thirds provided rounded estimates of expected investment. This is significantly higher than for businesses with more than 140 employees, who rounded only 3 per cent of actual expenditure, and 42 per cent of expected expenditure (footnote 4).

The association of under-reporting with rounded responses, suggests that smaller businesses have relatively more difficulty providing an accurate response to the survey, symptomatic of a lack of detailed forward planning of estimates.

The ABS is aware that the different investment behaviour between small and large businesses affects realisation ratios, and is currently investigating the feasibility of publishing separate estimates for small and large businesses.

APPLICATION OF REALISATION RATIOS

Realisation ratios may be directly compared for the same reporting period (or Estimate) for different years (down the columns of Table 2). The annual movement in the ratio rather than the level, provides a useful guide as to whether business units are becoming increasingly optimistic (or pessimistic) about current and future business conditions.

The systematic bias in realisation ratios however prevents their direct comparison for different reporting periods (i.e. Estimates 1 - 7 along the rows of Table 2). For making such comparisons, it is more useful to use realisation ratios to adjust expected investment for known under or over realisation patterns, than to directly interpret business sentiment or future investment. Adjusting the expectation by a realisation ratio for known bias in the responses enables expectations data to be used as an information set, containing general information about past, and expected future movements in variables such as aggregate demand, profits, interest rates and unemployment (depending on the type of investment and industry, these and other variables may assume greater or lesser importance). Risk and uncertainty in relation to economic policy and future economic conditions may also be an important determinant in expectations formation.

Three examples for adjusting expectations by realisation ratios are presented, and highlighted in Table 5. Example 1 and 2 demonstrate a simple adjustment for the most recent estimate obtained from the September 1993 survey, using the most recent realisation ratio and the 5 year average. This adjustment technique may be applied directly to Estimates 3 to 6. Example 3 presents a 2 step adjustment for the most forward looking expectation, Estimate 1. A 2 step adjustment is necessary for both Estimate 1 and 2, because only 6 and 9 months, respectively, of the previous 12 months actual investment outlays has been reported when the long term expectations for Estimates 1 (December quarter) and 2 (March quarter) are formed, and

therefore 12 months of realised outcomes for calculating the realisation ratio is not available. In order to include the latest available information of the business cycle, it is important to forecast the previous years investment (Step 1) and then adjust Estimates 1 and 2 using the realisation ratio based on this forecast (Step 2).

TABLE 5. ACTUAL AND EXPECTED PRIVATE NEW CAPITAL EXPENDITURE FOR FINANCIAL YEARS

Year Ending	Progressive estimates of actual and expected investment for financial years						
	Estimate 1	Estimate 2	Estimate 3	Estimate 4	Estimate 5	Estimate 6	Estimate 7
1992	23,450	23,536	24,964	25,486	25,120	25,156	24,244
1993	20,985	23,336	24,549	25,498	26,513	26,874	25,802
1994	22,178	23,684	24,167	25,586			?
Bold numbers are used to highlight example 1							
1992	23,450	23,536	24,964	25,486	25,120	25,156	24,244
1993	20,985	23,336	24,549	25,498	26,513		
1994	22,178						
Bold numbers are used to highlight example 3 - Step 1							
1992	23,450	23,536	24,964	25,486	25,120	25,156	24,244
1993	20,985	23,336	24,549	25,498	26,513		25,588
1994	22,178						?
Bold numbers are used to highlight example 3 - Step 2							

Example 1: Estimate 4 collected in the September quarter 1993 survey, may be adjusted using the realisation ratio of Estimate 4, referenced in the September quarter 1992.

Using the realisation ratio of Estimate 4 from the September 1992 survey:

$$= 25586 \times 25802/25498$$

$$= 25586 \times 1.01$$

$$= 25891 \text{ m}$$

Percentage change on previous year

$$= (25891/25802) - 1 = 0.003$$

i.e. Investment for the 12 months ending June 1994 is expected to rise 0.3 per cent on the corresponding 12 months of the previous year.

Example 2: Using the 5 year average of Estimate 4 referenced in the September quarter 1992:

$$= 25586 \times 0.99 = 25330.1$$

Percentage change on previous year

$$= (25330.1/25802) - 1 = -0.018$$

i.e. Investment for the 12 months ending June 1994 is expected to fall 1.8 per cent on the corresponding 12 months of the previous year. The investment out-look for June 1994 based on the 5 year average (down 1.8 per cent) is pessimistic whereas the out-look based on the ratio for the previous period (up 0.3 per cent) is slightly optimistic.

Example 3: A 2 step method for forecasting financial year investment using Estimate 1.

Step 1: Forecast 1992-93 investment by adjusting Estimate 5 reported in the December 1992 survey.

$$= 26513 \times 24244/25120$$

$$= 25588.4$$

Step 2: Forecast next financial years investment by adjusting Estimate 1 using the financial year investment forecasted in Step 1 and Estimate 1 reported in the December 1991 survey.

$$= 22178 \times 25588.4/20985$$

$$= 27043.1$$

Percentage change on previous year

$$= (27043.1/25588.4) - 1 = 0.057$$

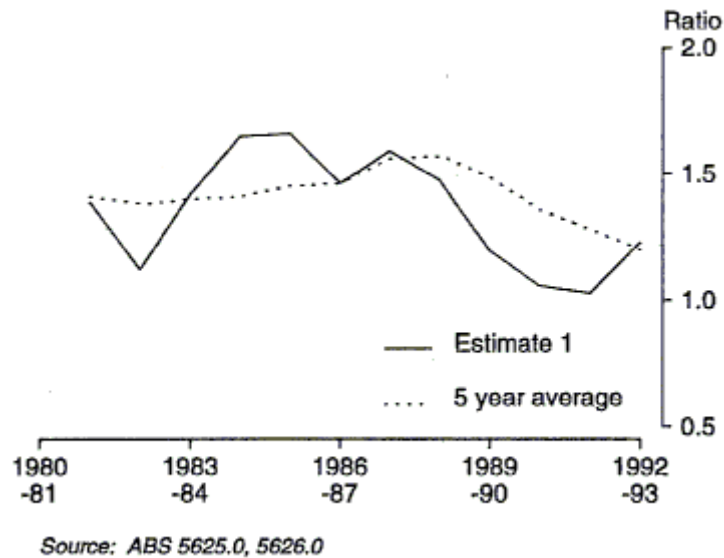
i.e. Investment for the 12 months ending June 1994 is predicted to rise 5.7 per cent on the corresponding (forecasted) 12 months ending June 1993.

The five year average

A standard practice in applying realisation ratios to capital expenditure is to apply a five year average of realisation ratios. When expectations are adjusted by the 5 year average, the averaging process introduces smoothness into the data by dampening the year to year fluctuations. However, the presence of a business cycle leads estimates adjusted by the five year average to systematically over or underestimate future investment for a number of periods.

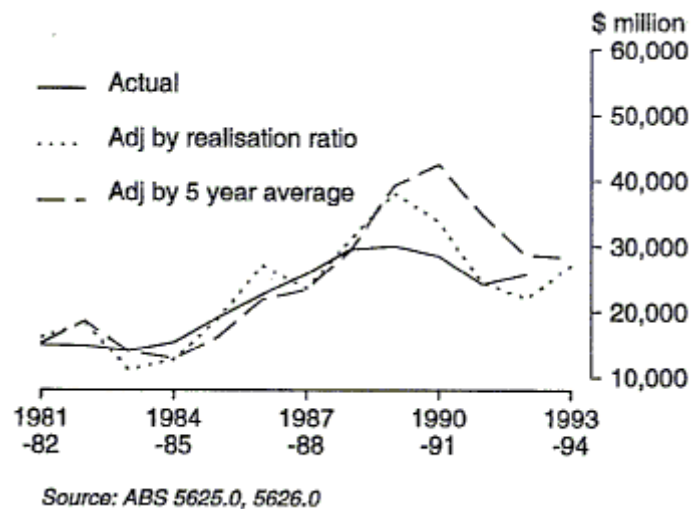
Graph 5 illustrates that the five year average effects both the level of the realisation ratio and its turning point. For Estimate 1, the level shift effect is quite pronounced. The 5 year average has almost completely smoothed both the effect of the 1982-83 recession and the growth from 1984 to 1986. Since 1989, the smoothed series remained about 20 percentage points above the realisation ratio. Placing the smoothed estimate against the last observation of each of the periods spanned also leads to a misrepresentation of the timing of major turning points. The turning points for 1986, 1987 and 1988 are reflected in a turning point in the 5 year average in 1989. Also the 1992 turning point in actual expenditure has not yet been reflected in the 5 year average as it indicates continued decline.

GRAPH 5. REALISATION RATIOS



Graph 6 indicates that five year averages react with a lag, leading to quite large forecast errors. For example the turning point in Estimate 1 adjusted by the five year average in 1991 clearly misrepresents both the 1990 turning point and the level of investment expenditure.

GRAPH 6. ESTIMATE 1 ADJUSTED BY REALISATION RATIOS, TOTAL EXPENDITURE



Graph 6 also indicates the volatility problem associated with using only the most recent ratio to adjust expectations data. An alternative approach is to use a trending process such as applied by ABS to other volatile series.

Evaluation of adjusted expectations

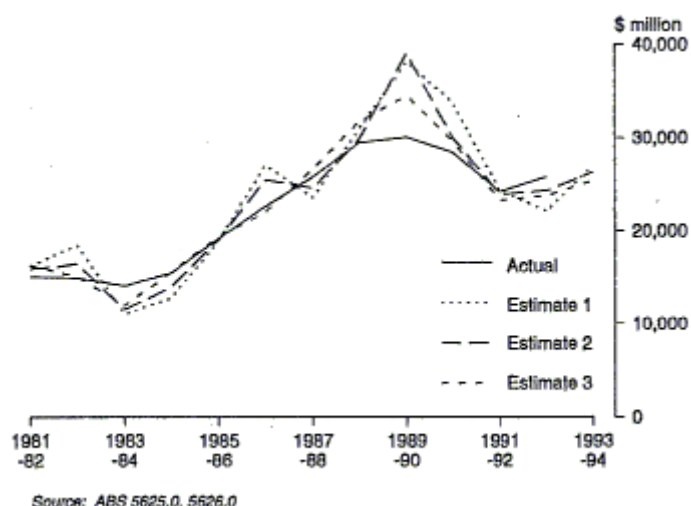
This section compares expectations adjusted by both the most recent realisation ratio and the five year average for average forecasting efficiency between 1982 and 1994. The overall forecast error as a percentage of the level of the value being forecasted, was used, enabling comparisons between forecast errors for each investment type and broad industry, where the levels of actual investment differ substantially. The statistic used to calculate the forecast error was the root mean squared percentage error (RMSPE). The RMSPE summarises all the deviations of the adjusted expectations from realised outcomes in one statistic.

As the financial year for which the estimate is made draws closer, the forecasts become increasingly efficient. For example, in total investment, the forecast error when estimates are adjusted using the realisation ratio of the previous year ranges from 15.6 per cent for Estimate 1 to 1.7 per cent for Estimate 6. This compares with a slightly higher 19.7 per cent to 1.3 per cent forecast error when expectations are adjusted by the five year average.

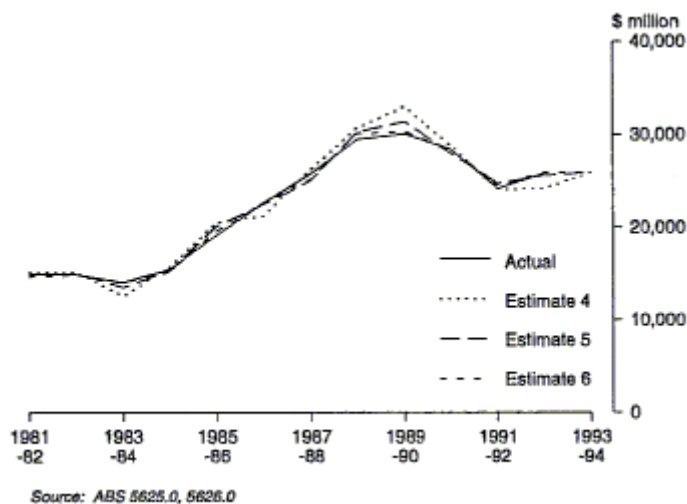
The forecast errors are also generally lower when adjusting estimates by the realisation ratio for the previous year rather than the 5 year average. An exception however is the mining industry, where strong volatility in investment outlays means that the forecast based on expectations adjusted by the 5 year average will often out perform forecasts based on estimates adjusted by the realisation ratio of the previous year.

Graphs 7 and 8 present forecasts based respectively on estimates 1, 2 and 3 and 4, 5 and 6 adjusted by the most recent realisation ratio. The relationship between forecast accuracy and the distance of the estimate from the financial year can clearly be seen, especially in the form of smaller under estimations after the 1983 recession in 1984 and smaller over estimations at the end of the growth period in 1990, between 1990 and 1991.

GRAPH 7. PROGRESSIVE ESTIMATES ADJUSTED BY REALISATION RATIOS, TOTAL EXPENDITURE



GRAPH 8. PROGRESSIVE ESTIMATES ADJUSTED BY REALISATION RATIOS, TOTAL EXPENDITURE



The first three forecasts often correctly predict the turning points in investment, such as in 1984,

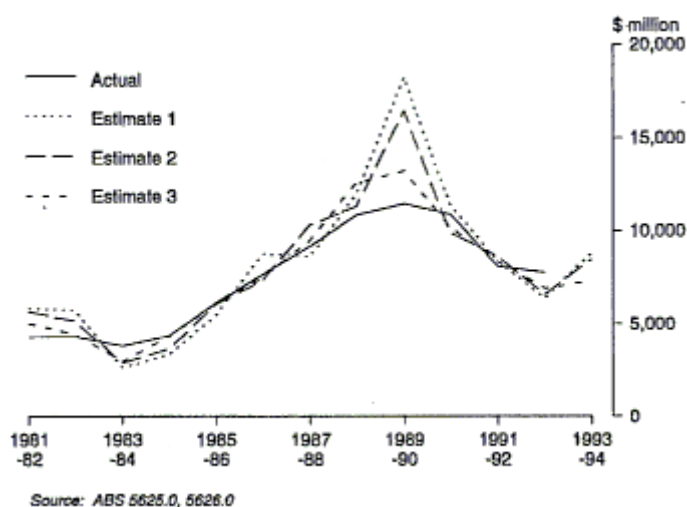
1990 and 1992. A turning point predicted by the first two forecasts in 1987 although not apparent in actual investment in the annual series, is apparent in a fall in seasonally adjusted actual expenditure in the March quarter 1987. The correct prediction of turning points indicates that Estimate 1 to 3 are leading indicators, as they were formed in earlier periods. However, due to the realisation ratio being formed in the previous year, adjusted forecasts of Estimate 1 to 3 are quite inaccurate in predicting the level of investment expenditure during a turning point. For example, the first forecast of investment for 1990 was approximately \$39,235 m, nearly \$9,000 m above the actual investment outlay of \$30,076 m.

In contrast, the forecasts calculated by adjusting Estimates 4 to 6 appear both accurate at predicting the level of investment and the turning points, although this outcome is assisted by successive components of realised investment outlays, leading to the convergence of these estimates towards actual expenditure.

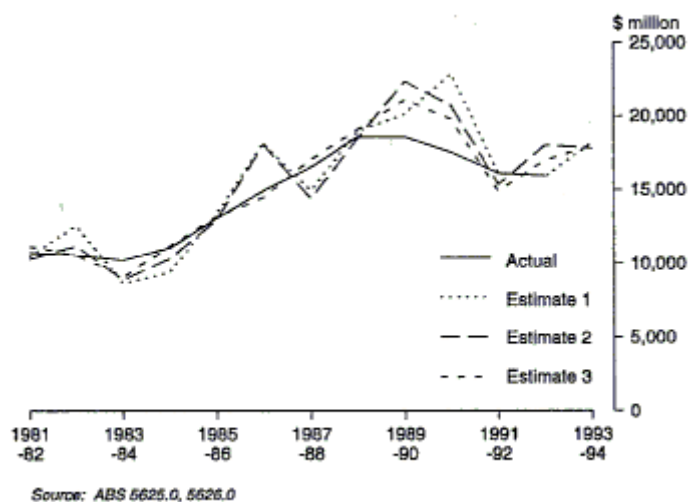
Forecasts by type of investment

Forecasts of investment in plant and equipment are considerably more efficient (ranging from 14.9 per cent to 2.7 per cent), than forecasts of buildings and structures (ranging from 24.4 per cent to 2.6 per cent). Graph 9 and 10 present the tracking performance of forecasts based upon the first 3 estimates against actual investment outlays. In building, an expected continuing office building boom in 1990 is responsible for a large proportion of the forecast error. In other years, equipment investment forecasts are more volatile than building forecasts (for instance the fluctuations in equipment forecasts in 1984, 1987, 1988, 1990 and 1991). The ability for businesses to time equipment investment, to maximise future returns (as opposed to long term contractual arrangements in building), may contribute to these swings.

GRAPH 9. PROGRESSIVE ESTIMATES ADJUSTED BY REALISATION RATIOS, BUILDING



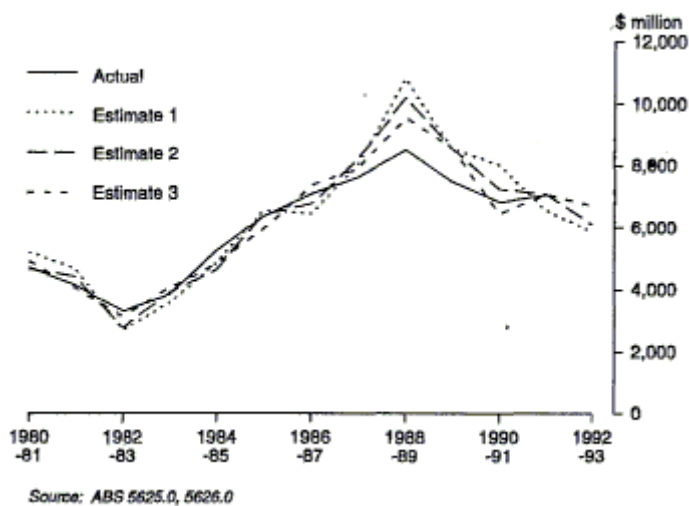
GRAPH 10. PROGRESSIVE ESTIMATES ADJUSTED BY REALISATION RATIOS, EQUIPMENT



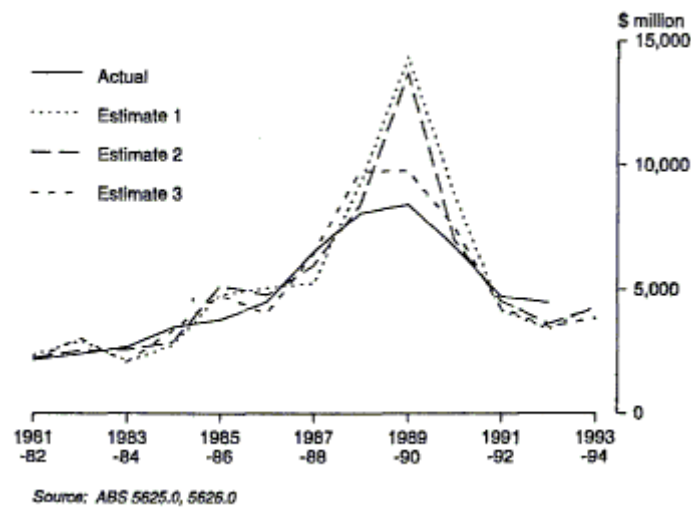
Forecasts by broad industry group

The range of accuracy of adjusted expectations for Estimate 1 to 6 respectively differs significantly across broad industry groups: Manufacturing 12.8 per cent to 2 per cent (forecast errors have been most significant since 1989, as actual investment outlays have remained well below the forecasts); Finance 26.6 per cent to 4.2 per cent (with the most recent forecasts have been quite close to actual investment outlays); Mining 21.3 per cent to 2.7 per cent (with the most recent forecasts predicting a strong upturn in investment); and Other Selected Industries 19.1 per cent to 2.8 per cent.

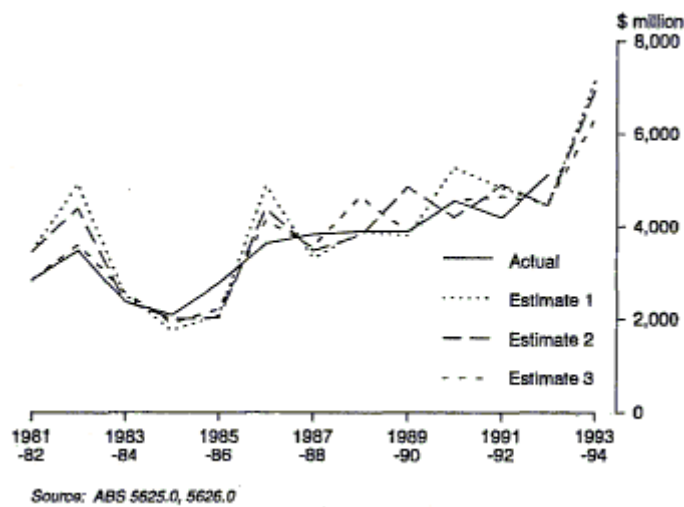
GRAPH 11. PROGRESSIVE ESTIMATES ADJUSTED BY REALISATION RATIOS, MANUFACTURING



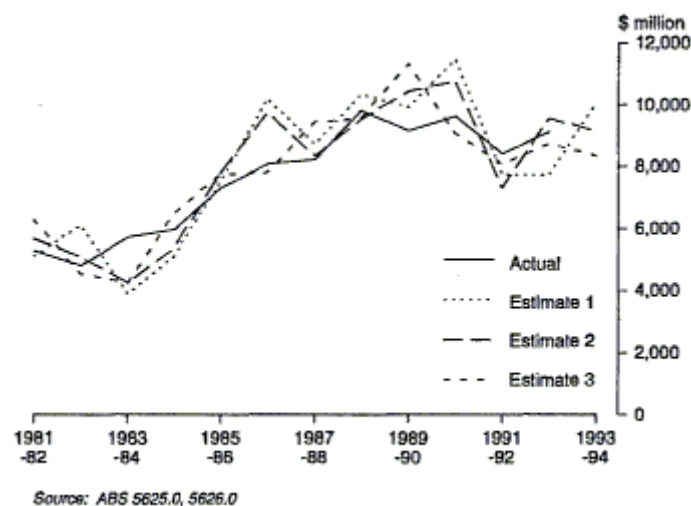
GRAPH 12. PROGRESSIVE ESTIMATES ADJUSTED BY REALISATION RATIOS, FINANCE



GRAPH 13. PROGRESSIVE ESTIMATES ADJUSTED BY REALISATION RATIOS, MINING



GRAPH 14. PROGRESSIVE ESTIMATES ADJUSTED BY REALISATION RATIOS, OTHER SELECTED INDUSTRIES



CONCLUSION

This article has discussed an approach to using the realisation ratios of investment in the Private New Capital Expenditure survey. It has shown that the underestimation of investment

expenditure is related to the size of the business, with smaller businesses reporting a relatively higher proportion of zero or conservative expectation compared to larger businesses. This under estimation increases as the length of the period before investment is realised increases.

The systematic underestimation of actual expenditure means that current estimates need to be adjusted for the under or over realisation patterns, before they can be used to forecast the direction, and level, of future investment. There could be expected benefits from applying such adjustments at the size level rather than in aggregate.

Estimates of investment expenditure are adjusted, by both the most recent realisation ratio and the 5 year average, and then compared for forecast accuracy. It is found in general that, between 1982 and 1994, estimates adjusted by the most recent realisation ratio produced more accurate forecasts, than estimates adjusted by the five year average. Most of the forecasts accurately predicted the turning points in investment. However, only the forecasts including some realised expenditure accurately and consistently predicted both the level and turning point in investment.

This feature article was contributed by Derek Burnell, National Accounts section, ABS.

Footnotes

1 . In response to the increasing need for regular quarterly and annual expectations data for forecasting, the ABS has developed a new Business Expectation Survey. Readers may refer to cat. no. 5250.0 Australian Business Expectations - Information Paper for more information on the background, objectives, design and development of this new survey. [<Back](#)

2. For a detailed technical analysis of the distribution of the individual records, readers may refer to the Econometrics Working Paper No. 93/i D. Burnell and P. Rossiter, investment Expectations: A Description of the Unit Record Data in the Private New Capital Expenditure Survey (cat. no. 1351.0). [<Back](#)

3. op. cit. [<Back](#)

4. op. cit. [<Back](#)

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